DOCUMENT RESUME

ED 044 124 LI 002 152

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TITLE	Library Cooperation in Metropolitan Baltimore: A New Approach to Determining Library Locations and Services (Review of Short and Long Range Work Programs Baltimore Metropolitan Area Library Study).
INSTITUTION	CONSAD Research Corp., Pittsburgh, Pa.
SPONS AGENCY	Maryland State Dept. of Education, Baltimore.; Regional Planning Council, Baltimore, Md.
PUB DATE	Jul 70
NOTE	42p.; Revised July, 1970
EDRS PRICE	EDRS Price MF-$0.25 HC-$2.20
DESCRIPTORS	*Library Cooperation, *Library Networks, *Library Planning, *Library Services, Library Surveys, Models, Public Libraries, *Regional Libraries, Systems Analysis, Use Studies
IDENTIFIERS	*Baltimore

ABSTRACT

Two parallel streams of work are the subject of this review: (1) the design of a long-range work program and planning process, and (2) the development of analytical techniques which give information about the use of libraries, new or old, and their service areas. The analytical model of library behavior proved illuminating, but is an area of investigation which requires more work. The process of developing the Long-Range Work Program called attention to the fact that the Enoch Pratt Free Library, Baltimore City, is critical to the functioning of the whole regional library complex and that each local library system is a part of the regional whole. The main emphasis of the Long-Range Work Program is on developing a system for long-range planning and budgeting as well as inter-agency cooperation. As such, the research is much more "process-oriented" than "product-oriented." The main emphasis of the Short-Range Work Program is to learn about the effect of library location and other variables upon the use of a library as an aid in location and planning of a new library facility. (MF)

ED044124

OCT 12 1970

LIBRARY COOPERATION IN METROPOLITAN BALTIMORE:

A NEW APPROACH TO DETERMINING LIBRARY LOCATIONS AND SERVICES

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Prepared for:

Librarian's Technical Steering Committee
and
Regional Planning Council
Baltimore, Maryland 21202

July, 1970

CONSAD Research Corporation

ED 044124

Library Cooperation in Metropolitan Baltimore: A New Approach to Determining Library Locations and Services

(Review of Short and Long Range Work Programs
Baltimore Metropolitan Area Library Study)

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701 St. Paul Street
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March, 1970
July, 1970 (revised)

The preparation of this report was financed in part through an agreement between the State Division of Library Development and Services, Maryland Department of Education, and the Regional Planning Council. Funding was under a grant to the State Division of Library Development and Services from the Department of Health, Education and Welfare as authorized by the Library Services and Construction Act of 1966.

FOREWORD

ATTAINMENT OF LIBRARY PURPOSES

AN INTRODUCTORY STATEMENT BY THE TECHNICAL STEERING COMMITTEE, BALTIMORE METROPOLITAN AREA LIBRARY STUDY

A new direction and a revised set of objectives are mandated for libraries. The new look in library service must come about from a combination of talents contributed by the experts in automation and information retrieval, working side by side with progressive librarians.

It is an exciting prospect to anticipate newly constituted and complete media and information centers comprising units within a national network dynamically serving every segment of our population. As a result, political leaders, educators, planners, and management experts will have been convinced of the need for massive support of libraries.

Well-informed and well-educated library personnel will staff our newly designed library buildings containing all types of media, as well as books, and communications equipment. Thus the library user benefits by virtue of the fact that he will have access to resources of all libraries in a national information system. Just as individual libraries no longer stand alone, they will no longer serve on a stand-by basis but will assume aggressive roles in reaching out to the population and reacting to total and diverse needs. In an era of rapid change, libraries, if they are to survive, must also change.

The traditional goals and purposes of a public library may be stated in these terms:

> Public library service is based on the recognition that its collections and services have an essential supportive role in the fulfillment of the needs and interests of indi-

viduals, groups and communities. It contributes to the larger goals of society through its resources for education, understanding and self-development.

The goal of the public library is to reach and serve the total public with materials in all forms that will meet its informational, educational, and cultural needs.

It is through the librarian's special expertise as mediator between the user and the record or source of information that this goal is approached. In order to reach its goal the public library must:

1. Provide ready and convenient access to a wide variety of subjects using materials in many forms.

2. Know the community and identify the needs and interests of its people, groups and agencies.

3. Offer library services in conveniently located functional facilities.

4. Provide staff qualified by a variety of educational backgrounds and expertise.

5. Offer a full range of services and programs for its clientele.

6. Provide a broad program of public information on library services and resources.

7. Have access and linkages to other library resources in the state and the nation in order to procure needed information and materials.

While great strides have been made by librarians in the implementation of these tasks, the higher level goals of society call for new efforts. It is necessary to review the service programs of libraries,

and to study patterns of organization with a view of meeting the challenges. To be specific, the following steps should be taken:

1. Re-examine the relationship of a library to other community, civic, educational or cultural institutions, especially schools, and complementary and supplementary services and resources.

(Place emphasis on an examination of the possibility of community schools providing a full range of services for a community, especially children; on larger units of service vs. many smaller units more easily reached; on service patterns as they relate to neighborhoods and people's interests and demands.)

2. Plan jointly among the various political subdivisions to provide a regional level of service which emulates the service offered by a single jurisdiction.

3. Provide special and non-traditional services for those who are physically handicapped, institutionalized, and those who are otherwise disadvantaged.

4. Seek ways to provide service to those who do not now use library systems.

(Branch location policies may need revision or staffs may need new training. Methods that have been tried such as bookmobiles, store front outlets and combined facilities should be evaluated in the course of planning programs, as should automobile parking areas in the planning of new facilities.)

5. Orient and educate all people to the knowledge, values and satisfaction that can be derived from reading books and using the other media available in libraries.

(Non-users and infrequent users may need special attention whereby out-reach tactics are employed to acquaint them with the potential of library services.)

6. Relate the requirements of a college student who uses a public library's resources to those in the academic library--the need for cooperative effort between these two types of libraries.

(Apply the same principal to all other types of libraries.)

7. Review functions, purposes, services and operational features of each type of library in order to achieve every meaningful economy and efficiency possible.
(Libraries should study patterns, extent and variety of service approach based on cost factors as well as use factors.)

8. Advance a broader role for libraries occasioned by appropriation of federal funds for increased cooperation within a state and regional library network.

9. Involve the public in decisions about library services through mechanisms such as citizen advisory groups.

10. Adapt automated equipment and rapid communications to library operations.

The combined planning efforts of the several jurisdictions involved in the Baltimore Metropolitan Area Library Study should produce a comprehensive plan to assist in the determination of services and facility locations that can expect optimum use. Information that can be derived from this kind of planning includes: (1) the type and level of collection to serve residents of different areas; (2) the extent of service programs; (3) the costs involved; and (4) the benefits to be derived from public participation in the decision-making process. If all such factors are brought into proper relationship, the trend will be for maximum use of each library by those persons residing in the facility's service area.

To aid in designing a decision-making process which would organize the work which the Committee envisioned for attainment of the public library's goal, assistance was obtained from the Regional Planning Council (Baltimore) and the consultants, CONSAD Research Corporation (Pittsburgh) and John and James Humphry (New York).

The long-range work program which resulted from this joint effort, though developed principally for three jurisdictions, is broad enough to be applicable to the entire Baltimore Region. In recognition of this fact and the need to cooperatively develop library service in the entire region, a formal Technical Committee on Library Service has been appointed by the Regional Planning Council. The new committee includes all participants in the initial work and in addition, the directors of the public libraries of Carroll, Harford, and Howard Counties. It will be the responsibility of this new and larger committee to evaluate and carry out where appropriate the concepts suggested in the Long-Range Work Program.

Technical Steering Committee
Baltimore Metropolitan Area Library Study

Chairman, Nettie B. Taylor, Director
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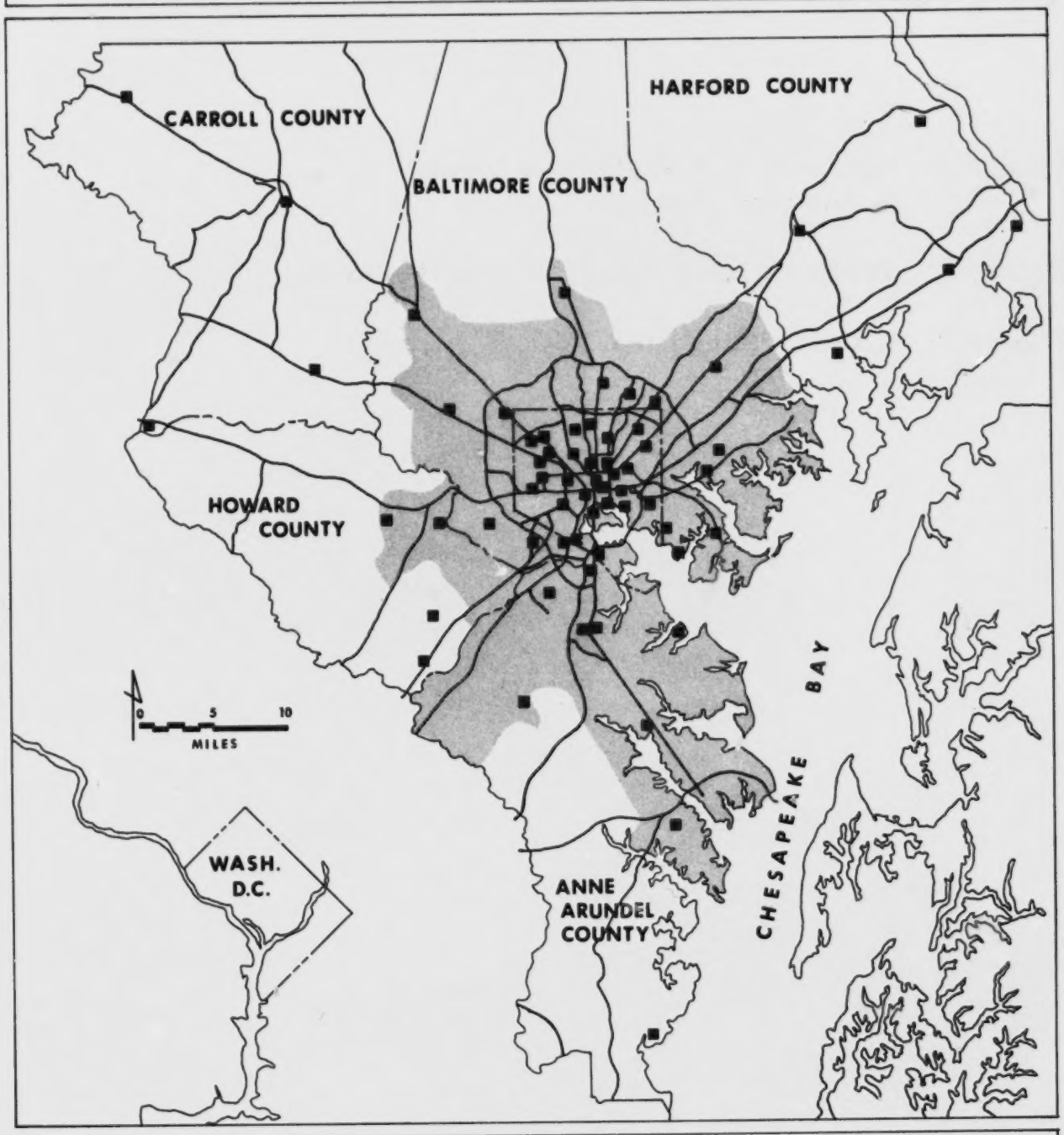
PUBLIC LIBRARIES - BALTIMORE REGION



■ LIBRARIES

URBANIZED AREA

—— MAJOR HIGHWAYS

REGIONAL PLANNING COUNCIL

MARCH 1970

A NEW APPROACH TO DETERMINING LIBRARY LOCATIONS AND SERVICES

Administrators of the Enoch Pratt Free Library in Baltimore and of the Baltimore County and Anne Arundel County Public Libraries have continually sought ways to plan and work cooperatively in the interest of serving library users more effectively. Effort has been put forth in such matters of mutual concern as locating libraries without regard to political boundries and levels of service that might be provided. The high quality of public library service available to most citizens in the metropolitan area attests to the success of these efforts. But as the information, education, and recreation needs of a dynamic and growing metropolitan population climb, each local library system finds that solutions to problems of library service become increasingly complex and, in fact, multi-jurisdictional in nature.

To approach their goal of "service to the total public," these administrators have looked for new aids to help in decision-making and new approaches to providing library service. They find information on which to base innovations and facility planning lacking, and the process for developing decision tools, inadequate. Very little basic research has been undertaken to learn quantitatively, how libraries answer the needs of users; moreover, techniques that can be used by decision-makers for evaluating the effectiveness of programs and facilities have just begun to be applied to library systems.

Working with the staff of the Division of Library Development and Services in the Maryland Department of Education, librarians of Baltimore City and Anne Arundel and Baltimore Counties applied through the state for federal funds to conduct a planning study encompassing these three jurisdictions. The Regional Planning Council,

Baltimore, was invited to direct the study. The Council contracted for the services of CONSAD Research Corporation in Pittsburgh, Pennsylvania, to provide computer-based statistical and mathematical analysis of library usage and to assist in suggesting procedures for long-term cooperative library planning. The undersigned library consultants were secured by the Regional Planning Council to advise CONSAD in the development of its study. A Technical Steering Committee, comprised of representatives of the libraries of the three jurisdictions, the State Division of Library Development and Services and the School of Library and Information Services of the University of Maryland developed the statement of the problem presented above and in the Foreword.

In response to the many concerns of the librarians, the joint effort resulted in two parallel streams of work which are the subject of this review: (1) the design of a long-range work program and planning process, and (2) the development of analytical techniques which give information about the use of libraries, new or old, and their service areas. Details of this work were given by CONSAD Research Corporation in:

> Baltimore Metropolitan Area Library Study, Recommended Long-Range Work Program, January 15, 1970.
>
> Behavioral Model for Use in Library Planning: Results of the Short-Range Work Program, June 23, 1969.

The analytical model of library behavior proved illuminating but an area of investigation requiring more work. The process of developing the Long-Range Work Program called attention to the fact that Enoch Pratt Free Library, Baltimore City, is critical to the

functioning of the whole regional library complex and that each local library system is a part of the regional whole. Although the study was intended to serve just three jurisdictions, it soon became evident that the proposed planning process and work program was applicable to the larger geographic area, the entire Baltimore Region.

LONG RANGE WORK PROGRAM

This work was directed to the general problem of determining how librarians in the Baltimore Region can better work together within the framework of a long-range regionwide planning and budgeting process. The plan which evolved includes proposals to organize information needed by decision-makers when developing long-range plans for the location of new library facilities, establishing cooperative regional services, and developing collections for special user groups. The planning process is called upon to provide a means for:

1. Identifying the types of information needed for decisions.

2. Indicating essential types of information which are lacking and which must be researched.

3. Storing and organizing substantive types of information that have already been generated for use in decision-making.

4. Organizing available analytic methods needed for various types of decisions, and to serve as a basis for other types of decisions.

5. Developing criteria for decision-making that relates objectives and priorities to available resources.

6. Identifying alternative sources of needed resources that exist in regional institutions or jurisdictions.

7. Coordinating and informing the decision-makers on how best to draw upon the resources in the region that relate either to local issues or to issues held in common.

In order to attain these objectives, it is recommended that a series of research efforts be undertaken which, when completed, will make available a set of interdependent components needed to implement the long-range planning process. These components, each of which will require a number of research tasks to develop, are:

A. An information and data system

B. Goals and needs analysis procedures

C. Cost-effectiveness analysis procedures

D. An inter-institutional linkage and fiscal resources study

E. A regionwide project selection and resource allocation procedure

F. A number of special studies

Of primary concern in the study design that was developed is the matter of implementation. The optimum long-range planning process would establish a set of decision-making services together with a framework for coordinating them. But the creation of a fully articulated framework is an effort of some magnitude. It requires the tools of science to yield information on causal relations and on efficient use of resources, as well as information handling capability on a large scale. In addition, the attainment of a fully articulated decision framework is time consuming and costly.

On the other side of the coin, the needs, interests, and "decision-styles" of those who would make use of such a system must be considered. The need to make decisions with long-range implications, such as the location of a new library, is always immediate and continuous. In addition, the range of factors considered by librarians as important for any given decision is, at present, considerably broader than the range of knowledge available in the systematic social sciences.

An example is the fact that improvement of library service may require the design and location of new library facilities to attract and serve low-education users. Although it is known that accessibility is an important factor in attracting low-education users, it is not clear in a systematic way how the reference services, skills of librarians,

and special features such as meeting rooms, type of collection and child-care services would affect library use in low-education neighborhoods.

Decisions cannot wait for "science," but, instead, must be based upon the partial information available. It is the intent of the suggested work program to identify and organize, as well as to expand, the amount of useful information that can be made available to guide the decision process, and to establish a flexible, developing, achievable framework for regionwide library planning.

The Long-Range Work Program is oriented towards establishing a continuing planning process that reflects the modern concepts of systems analysis (See Figure 1). It may help to point out that, in the context of this review, the terms "library system" and "systems analysis" relate to different things. Many librarians when using the word "system" think of it as an organization or group of libraries working together for the improvement of service programs. This it is; however, when the term "system analysis" is used by experts in management, it refers to the mechanism whereby the effectiveness of an organization can be assessed and steps taken to improve its efficiency.

Systems analysis often utilizes the tools of operations research which have been applied successfully to the military, to industry and, in more recent years, to government. The application of operations research produces information which the administrator can use to improve efficiency in accordance with the overall objectives of the organization he directs. While this technique is difficult to apply to libraries, it is being done. Philip M. Morse,* professor of physics

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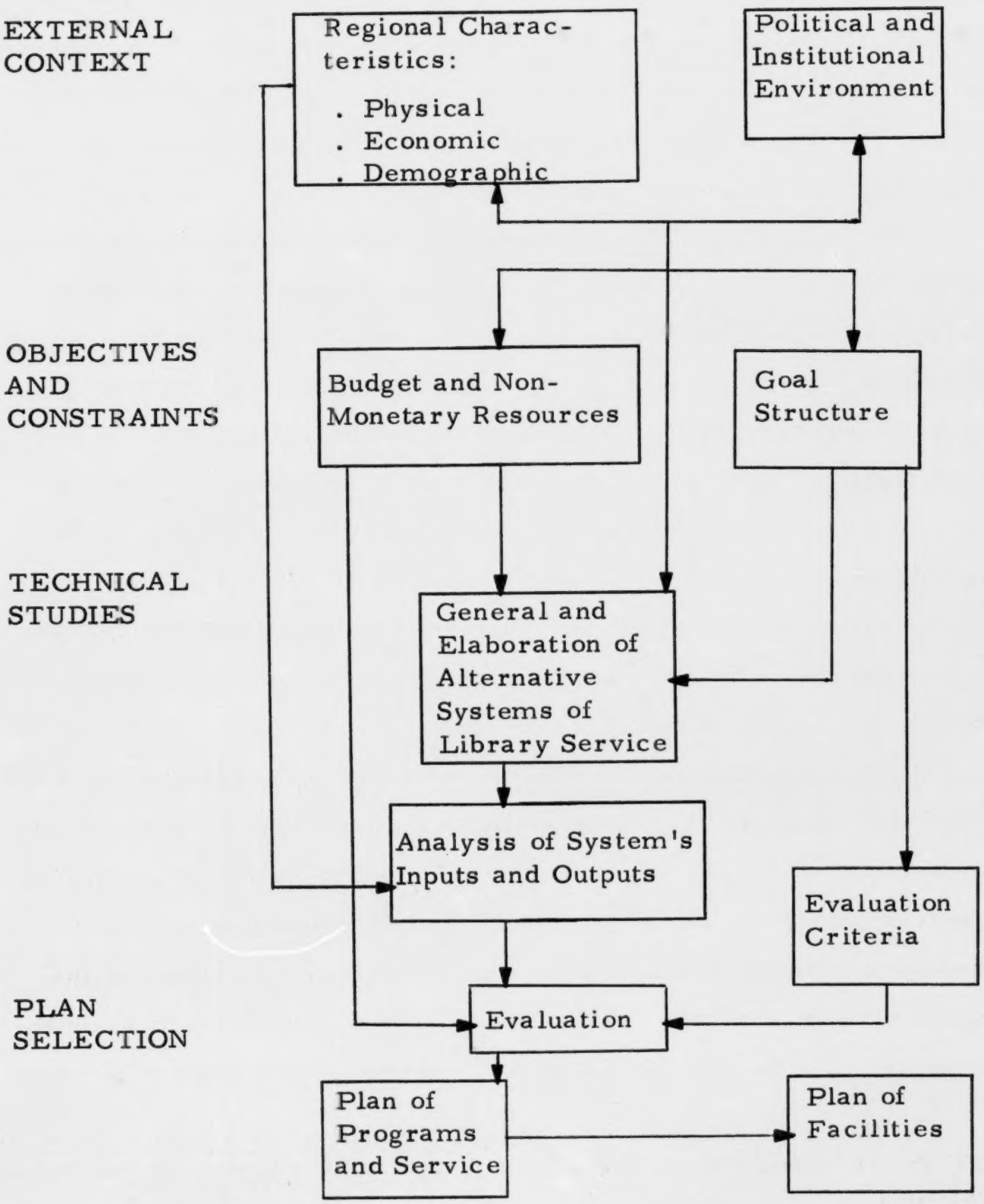
* Philip M. Morse, Library Effectiveness: A Systems Approach, MIT Press, Cambridge, Mass., 1968; Operations Research for Public Systems, 1967.

FIGURE 1

DIAGRAM OF A SYSTEMS APPROACH
TO LIBRARY PLANNING



at MIT and an expert in operations research, has written extensively on the subject. He is convinced that librarians and systems analysts should work together to increase the effectiveness of libraries.

Systems analysis for public libraries as outlined in the Long-Range Work Program involves four levels. At the highest level, the region's physical, economic and demographic characteristics and its political and institutional environment determine the external context in which the system is embedded.

The systems analysis, per se, begins at the next level where the budget and goal structure define and delimit the system. The budget is taken as fixed, although the properly prepared plan may have considerable budgetary influence. One of the most critical and often neglected parts of the planning process is determination of the system's objectives or goal structure. The recent involvement of citizen participation in the planning process has high-lighted the fact that ends are as often in dispute as are means-to-an-end. Means-to-an-end plans can be evaluated only if the system's objective is clearly understood and explicitly formulated.

The next level, technical studies, includes the generation and elaboration of alternate plans which typically engage the planner's prime attention, often, unfortunately, to the neglect of other aspects of the planning process. The alternate service and facility plans are then analyzed to establish inputs required and outputs generated by them, in terms of criteria relevant to the system's objectives.

In the final level, the plan selection phase, performance of the plan is evaluated on the basis of the systems performance criteria, how well the system meets objectives given the external context and constraints. The result is a selection of a library plan for implementation.

The way in which the tasks of the Long-Range Work Program support the system for library planning is depicted in Figure 2. Note that the Regional Planning Council and the Technical Committee on Library Service are relied upon to provide the external context in which the library planning system functions. Support for all aspects of the system is provided by the planning information system, Work Element A, while the other work tasks, individually or together, comprise Objectives and Constraints, Technical Studies, or Plan Selection.

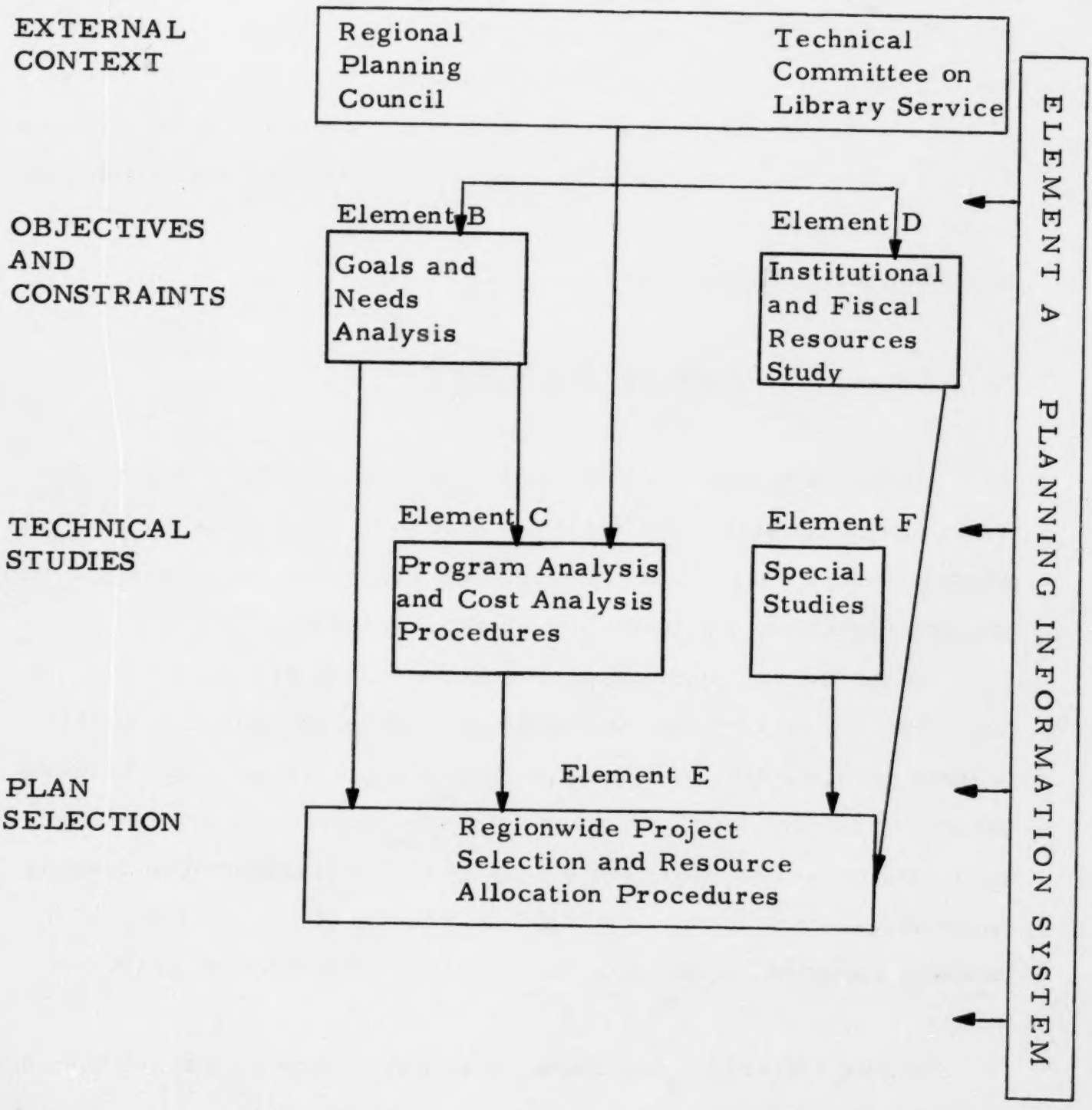
Work Element A: Planning Information System

Rational decision-making necessitates the acquisition of evaluative information. In library planning, information is needed that describes the benefits and costs of alternative library locations, sizes, operating procedures, services, and so on.

The objective of this work element is to develop a system to organize all available information required for making library planning decisions, as well as for identifying information gaps. The format of this planning information system would be in consonance with cost-benefit or resource allocation methodology. The system requires a framework for explicitly relating the inputs consumed by the library system to the outputs which it produces. This framework could be organized either by function or by objective. The heart of the system resides in an "accounting" procedure which would continually gather information on library inputs and outputs. The librarians may thus be able to see much more clearly what their budget is buying, and thus to evaluate alternative means of redistributing the budget.

FIGURE 2

TASKS OF LONG-RANGE WORK PROGRAM



Because the Planning Information System is intended for use in the decision-making process by the librarians, emphasis must be placed upon its clarity, accessibility, and susceptibility to updating as new information becomes available. In addition, since it is intended as a descriptive rather than an analytical tool, work may be initiated toward its development for use in the immediate future.

Although the accounting framework should be relatively formal due to requirements for specific information on benefits and costs, it need not be computer oriented. A simple file would be an adequate tool for organizing, maintaining, and retrieving the information and would be much more in agreement with the objective of rapid implementation for immediate use.

Work Element B: Goals and Needs Analysis

The development of a rational plan assumes that a means-to-an-end logic has been established. That is to say, plans are rational insofar as they describe a set of actions that relate to the achievement of some objective, whatever that objective may be.

In the library planning process, the means are quite clear, in that libraries make books and other "stored information" available to their constituents. The results or goals are not so clear because objectives toward which library plans may be directed are usually quite general. The Goals and Needs Analysis is intended to develop methods by which library administrators may obtain the kinds of information needed for the process of establishing a set of goals and values.

Public libraries, like many other governmental institutions, have traditionally established values for the services they provide through

internal judgmental procedures. Leadership is exercised in determining what kinds of services are beneficial to users. The value judgments of leadership are applied not only to types of services, but also to the distribution of such services to the various groups of society. The selection of services for inclusion in the budget requires that the library establish two sets of relative values, one for each type of service and one for each group of users. Once these values are either explicitly or implicitly established, decisions as to the types of services to be provided and their distribution can be made.

For example, the American Library Association's publication, Minimum Standards for Public Library Systems, 1966, includes both quantitative and qualitative standards. This document serves as a guide to developing goals and objectives and the methods by which they can be reached. Goals should be stated in terms of performance measures which reflect the degree of success with which the library is providing services to its constituents.

Information about the services required by various groups of users necessary to construct the proper measures of performance, may be obtained from three sources:

1. Data on circulation of materials and on requests from each branch library.

2. Survey of users at each branch.

3. Field survey of users and non-users.

With this information, the values placed upon library service by the several groups of users can be interpreted either subjectively by library leadership or objectively by noting (1) the relative frequency of demands for each service, and (2) the relative weight accorded each demand by the group. In other words, if some users are willing to travel a considerable distance to use the book and information ser-

vices of a library, it is fair to say that significant weight is attached to this kind of service.

Work Element C: Cost Analysis Procedures

The evaluation of alternative means for the provision of various library services requires information on the effectiveness of each alternative in contributing to the achievement of goals and information on costs. If this kind of quantitative information could be accurately calculated for every alternative being considered for inclusion in the budget, the job of developing a rational long-range planning and budgeting process would be largely completed. But quantitative analysis has not been sufficiently encompassing to provide a complete set of cost-effectiveness data for all project alternatives, and therefore, a process for compiling and estimating this information must be developed.

The kinds of cost effectiveness estimates that will be required for the planning process are dictated by the kinds of activities, and the alternative means for implementing them that are under consideration by the librarians. It is certain that the location of facilities for future population patterns will be considered and that the size and variety of collections and the non-book services that should be provided at each facility, whether old or new, will be questioned. Questions of alternative kinds of facilities to serve special user groups such as the handicapped, disadvantaged, and students will require cost effectiveness estimates. Questions of internal library organization will also require cost effectiveness data for evaluation such as alternate staffing patterns and the use of computers and mechanized systems.

Many of these kinds of alternatives required cost effectiveness information that is not difficult to obtain. For example, the dissertations of doctoral candidates in library science, the published findings of past research projects, and the information assembled with which to carry out effective library planning (Work Element A) will provide many pieces of the mosaic of data needed to evaluate alternatives such as computerized systems, techniques for providing special services, staffing patterns, alternatives, etc. Often only a relatively slight effort in searching, organizing, summarizing, and/or analyzing this available information will be sufficient to provide useful cost-effectiveness, i.e., to develop partial models of cost or of effectiveness.

Information relating to library location, scale, collection composition, and non-book services, on the other hand, is more difficult to obtain because the parameters for estimating the effectiveness of the alternatives vary from city to city depending upon the behavior patterns and needs of city population groups. For this reason, evaluation of alternative plans for library facility expansion and location requires development of systems analytic models* that can estimate the effect of many factors varying simultaneously.

In estimating the effects of alternative arrangements of branches, the use of systems models is especially necessary because the effectiveness of a single facility in terms of its size, location, and collection characteristics depends upon the characteristics of related

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* A model may be defined as a simplified description of a real world situation or problem. When used in systems analysis, the description is usually in mathematical terms and may be described more narrowly as an abstract representation of a set of variables.

In using operations research as a tool of management, models as aids to decision-making are commonly used. Knowledge and skill in the use of statistics and mathematics are desirable, if not essential, in the development of models.

facilities. For example, the location of a small facility in a neighborhood where automobile ownership is high may be of little effectiveness in contributing to library goals if another large facility is being planned at another location which, although relatively distant, is still accessible to the neighborhood.

The first step toward the development of a multi-facility evaluation model, that of developing a single-facility model, was undertaken in the Short-Range Work Program, described in the following section. The single-facility model that was developed, however, requires (a) refinement to incorporate detail on characteristics of collections including size and composition and (b) extension to incorporate simultaneous evaluation of many facilities.

Work Element D: Institutional and Fiscal Resources Study

Not only do libraries cooperate among themselves (as, for example, in areas of interlibrary loan and the proposed sharing of central book cataloguing and processing), but also libraries may cooperate with other institutions--schools, colleges, vocational institutions, professional societies and organizations, business, industry and government.

The study of cooperative activities should properly include the study of functions in all areas of library activity--reference, circulation, acquisition, technical services, administration--viewed within the framework of present and projected physical facilities, organizational structures, economics and staffing. Obviously, the implications of a cooperative activity are widespread over these kinds of considerations. As an example, a decision to cooperate in the pre-

paration and maintenance of a union catalogue (or a union list of serials, a book processing center or a shared tape service, to list a few examples) depends on a determination of:

1. Policies necessary to accomplish the task.

2. Resources needed.

3. Contributions from each of the cooperating agencies needed to "cover" these resources in terms of time, staff, materials, administration and financial support.

4. Compatibility among cooperating agencies and the adjustments that would have to be made to accommodate or change the policies of participating institutions.

5. Conversion decisions (as to retrospective or only current practices) in this specified area.

The areas in which cooperation can occur are diverse. They may include the following:

1. Location of new facilities.

2. Materials (via interlibrary loan), reference center, subject specialization centers.

3. Facilities (unrestricted to users outside the jurisdiction of the individual library or provision of specialized materials and services).

4. Information networks (sharing of data-bases, computers and computer programs for handling the information; specialized staff to service the facility; time-sharing and on-line terminal services).

There are numerous tasks to be performed to aid the decision-maker (administrator) in the above mentioned areas. Information should be gathered on facilities, organizational structures, collection statistics (and descriptions of use and restrictions), financial

data (budgets, tax bases, projections and allocations). An analysis of these data will help determine use rates, participation rates, complementary and supplementary service areas and functions, compatible and incompatible policies and usages, bottlenecks in operations and functions, high-cost time (not only in terms of money, but also time and manpower).

An analysis of the factors most relevant to cooperation (e.g., interest in sharing materials, processing, personnel, joint-facilities, financial planning) is needed in order to set up priorities among the cooperating libraries. Adjustments among these priorities will have to be made explicit to these organizations so that rational decisions can be made.

Work Element E: Regionwide Project Selection and Resource Allocation Procedures

The technical information for comparing a given alternative with other alternatives will be obtained from Work Element C: Cost Effectiveness Analysis Procedure. In Work Element E, procedures are to be developed for selecting one alternative over another.

In many cases, the selection procedure is quite simple and direct. If only one goal exists and just one budget period is expected to constrain the program, then that alternative is selected that provides the highest contribution to goal attainment for the available budget. But if alternatives contribute to several goals simultaneously and, in the more difficult case, if the selection of one alternative affects the goal contributions of other alternatives, then the selection procedures are more complicated.

Such procedures in the past have been entirely judgmental. For example, a set of projects may be presented one-at-a-time to a lay board which would select by vote. If the resulting array of projects exceeds the available budget, then a reappraisal might be required.

It is the purpose of this work element to provide better information as a basis for judging alternatives which in turn would affect plans and budgets.

Evaluation of planning alternatives may proceed on a trial-and-error basis, drawing upon judgment combined with certain formal procedures or attempts may be made to use information obtained from detailed studies and research. Either method requires an organized body of information such as would be provided via Work Element A. It will be the task of this work element to organize the findings and results of all other work elements into a procedure for aiding in the project selection and plan-formulation process. To do so, various aspects of formal evaluation techniques that are operational must be drawn upon and incorporated in a selection procedure. In its early stages of development, this procedure will be largely based upon informed judgment and will be of an "organized trial-and-error nature." Those methods will make heavy use of the cost effectiveness techniques, value and needs statements, fiscal resource and inter-institutional linkage information provided in the other sections of the Long-Range Work Program. These will be combined to form a set of <u>planning guidelines</u>, the result of Work Element E.

Work Element F: Special Studies

The main emphasis of the Long-Range Work Program is on developing a system for long-range planning and budgeting as well as inter-agency cooperation. As such, the research is much more "process-oriented" than "product-oriented." It would not be surprising, however, to discover that to properly implement the process of long-range planning, some studies of particular problems or opportunities (e.g., service to the disadvantaged, joint processing centers, etc.) may be required. Thus this open-ended and undefined work element is formally included in the work program. It is believed that the primary constraint on progress lies not in the lack of specific information but on institutional inability to organize and utilize this information in planning and budgeting procedures. For this reason, the conduct of special subject studies occupies a distinctly secondary role in the overall work program.

THE SHORT TERM INVESTIGATION

The Behavioral Model

The Short-Range Work Program* emphasized the development and demonstration of an analytical method to serve library planners who are searching for improved criteria to help determine library locations. It is an example of the effectiveness studies envisioned in the Long-Range Work Program under Work Element C, Cost Analysis Procedures, and was selected as a pilot effort in response to a prime need of administrators for better information with which to formulate capital improvement programs.

The purpose of the Short-Range Work Program was to learn about the effect of library location and other variables upon the use of a library so as to aid in locating and planning a new library facility. An immediate concern of policy-makers is the determination of the number of people likely to use a new library. Thus, it was decided that the most useful product, in the short range, would be a means to predict use as a function of the size, collection and location of the library.

Although the investigation provided valuable information for planning purposes, only a part of the problem was attacked. Emphasized was the limited problem of use of one service unit; omitted was the broader question of the effect of a new facility upon total use pattern of the library system. Nevertheless, the question of location

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* CONSAD Research Corporation, A Behavioral Model for Use in Library Planning: Results of the Short Range Work Program, Pittsburgh, June, 1969.

and use commands the attention of the policy-maker under the current system of library planning, and therefore was considered most appropriate.

One approach in systems analysis is to assemble data, analyze it, and determine a behavioral pattern that can become a model or demonstration for the decision-maker. This, in essence, was the approach that was used. A descriptive model was formulated to represent a situation, namely, library use versus distance from library facilities and library use measured against various levels of library programs and services.

It should be pointed out that systems analysis requires a statement of the objectives of the libraries involved in studies. By judging results against the library objective, administrators can assess the effectiveness of various and alternative library facilities. Both the Short and the Long-Range Work Programs required an understanding of how the various characteristics of libraries advance, or do not advance, the achievement of objectives. In the former, the approach has been on a preliminary basis through interviews with the librarians of each jurisdiction; long-range work calls for a broader effort through statistical analysis of behavioral relationships among the many elements of a library system.

Discussions with the librarians pointed to the difficulty and complexity of defining library objectives. (See Foreword, Attainment of Library Purposes.) Before any definitive statement of objectives can be made, much discussion, candor, and study will be required of both the decision-makers and the researchers. Nevertheless, the exigencies of model development required the making of at least a preliminary statement of the objectives of the library system. The one selected

was inherent in most general goal statements reviewed and it satisfied the analytical requirement that its degree of attainment be measurable:

> An overall objective of the library system is to improve library service. Improvement in library services may tentatively be measured by the increased use of library facilities.

Using data that was available, certain conclusions were readily drawn and quantified. Users who live in close proximity to a library will use it more than those of greater distances, and highly developed resources and efficient services will attract people from considerable distances.

Problems with data also were identified. It became clear that developing a model that will provide help to the decision-maker in locating library facilities, and in determining what kinds of services will prove attractive in relation to a system of libraries, is a complex task requiring much more information for input. Thus, the Long-Range Work Program suggests some subject studies to produce sufficient and varied information to feed a more complex model. Using this more advanced model, behavioral patterns of library users should become clearer.

Some information about the use of various libraries in the metropolitan Baltimore area was available from the user survey taken in 1965 by Professor Mary Lee Bundy of the University of Maryland's School of Library and Information Services.* Two pieces of information were especially helpful: (1) how many adults (over age 12) used

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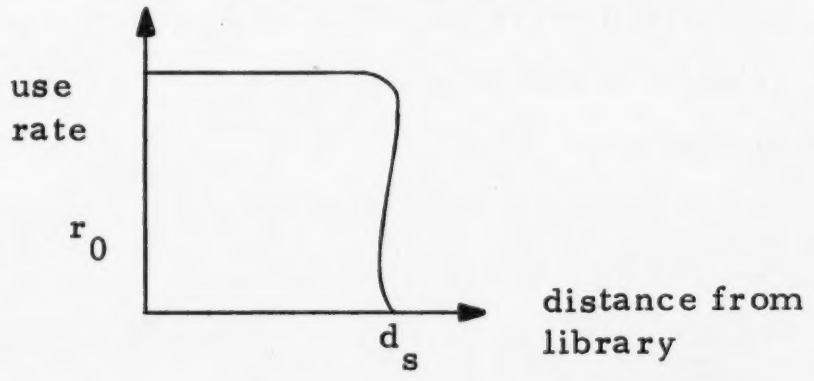
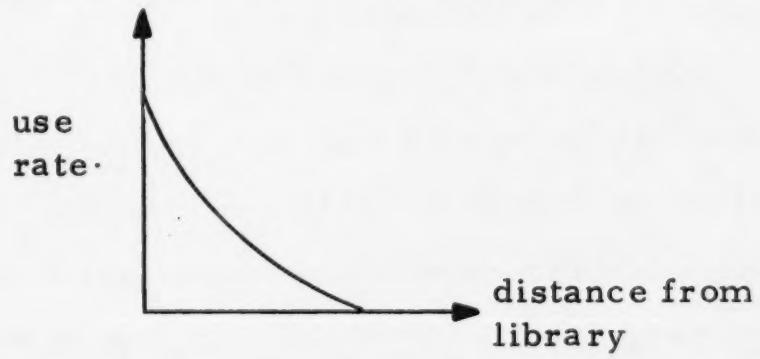
* Mary Lee Bundy, Metropolitan Public Library Users, The University of Maryland, College Park, Maryland, 1968.

each facility in a typical week, and (2) how far these users traveled on their trips to the library.

First of all, the travel behavior of the users was closely examined to determine how use declined with increasing distance. It is often assumed, in analyzing library use, that each library has a defined service area and that within this area the rate of use (number of users/total population) is constant. Thus, a plot of use rate versus distance for this "service area" hypothesis might look like this:



This curve can be summarized by two numbers, the usage rate, r_0, and the typical radius of the service area, d_s. In contrast to this simple assumption, however, the Bundy data disclosed a somewhat different picture. A plot of rate of use versus distance from the library, on the basis of the Bundy data would look like this:



This curve shows that use declines steadily with increasing distance, from a library. A mathematician would say that the decline in use is exponential with distance. This curve too can be completely summarized by just two numbers: the use rate at zero distance; and a quantity which describes the rate at which use falls off with distance.

This initial finding of exponential use behavior was valuable in several respects, from the standpoint of gaining both a qualitative and a quantitative understanding of library use.

From a qualitative point of view, it led to a recognition that library use is very sensitive to the separation between facility and potential users; that the rate of use by persons living close to a facility greatly exceeds that of those residing at moderately greater distances. This supports the statement often made that the potential user must "trip over" the facility in order to use it, and thus there exists a large latent demand for library service. It also showed that the behavior of library users, in the aggregate, can be well approximated by a simple mathematical expression.

From a quantitative point of view, it led to a recognition that the two numbers which describe the use curve could be measured quite accurately for each library; and that these two quantities appeared to be related to the characteristics of the library, i.e., its location, the size and composition of its population, and the size and the characteristics of its collection of materials.

The next step in the short-range study involved a determination of how the two quantities describing use were related to a facility's characteristics. Statistics of use were tabulated of those who walked and of those who drove to the library. Then for each of these two modes of travel, the two parameters describing use were estimated; the zero-distance participation rate and the rate of decline of attendance with distance. Thus four relationships had to be determined.

Data describing the observed use and the corresponding facility characteristics were available from approximately forty branch libraries in the Baltimore area, ranging from very small to very large in size, and in location from central city to suburban fringe. Even

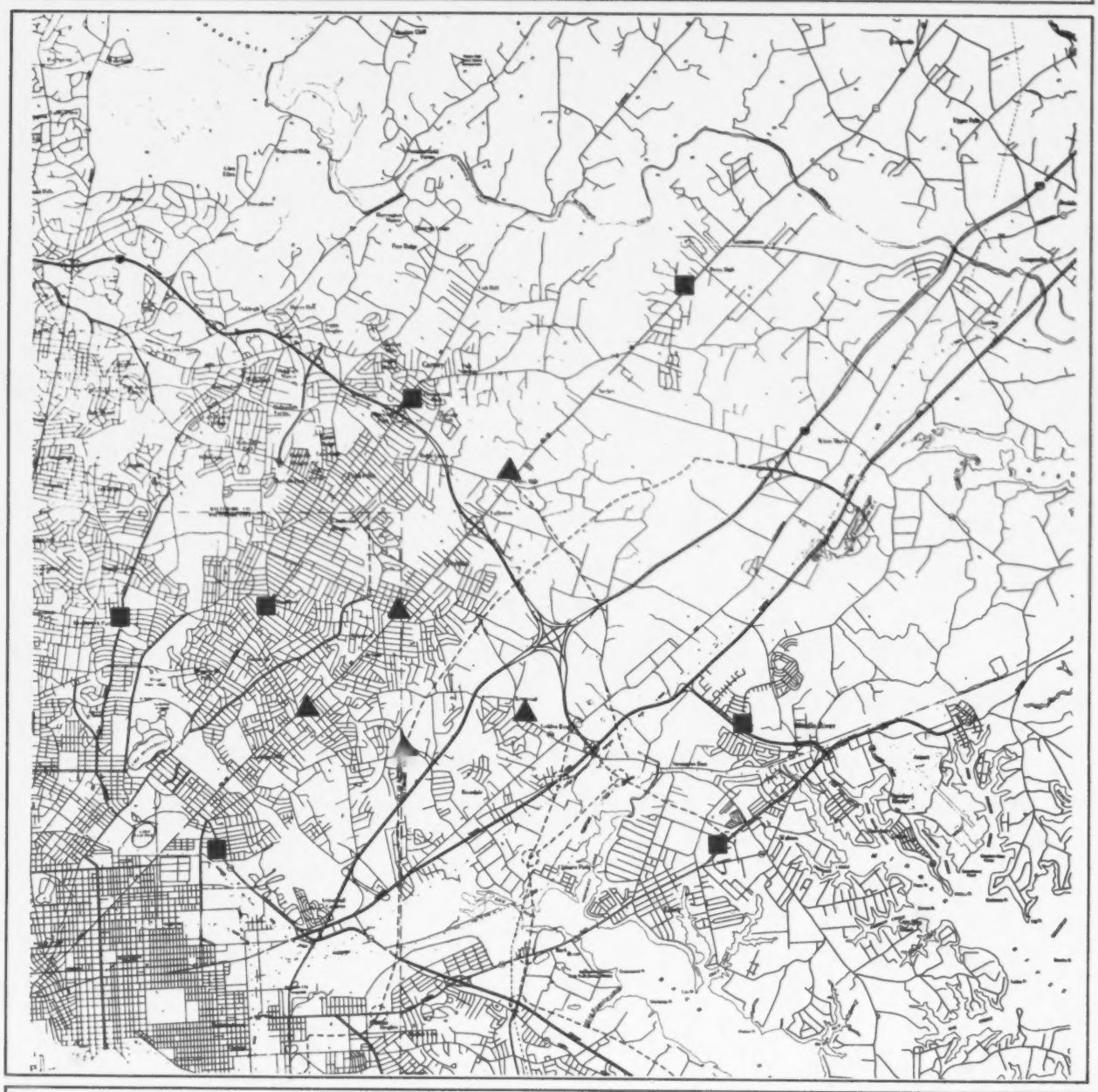
across the broad range of size and location, the relationship between use parameters and library characteristics was found to be strong and statistically significant. The results indicated that the factors underlying aggregate library use can be well described by a statistically estimated mathematical expression.

Once the use of existing libraries is reliably related to the characteristics of those facilities, it is a simple matter to apply the methodology to predicting use at a proposed new facility. The location and collection of the proposed facility are first postulated. From this, the basic relevant characteristics--number and nature of the population to be served, and the scope and sophistication of the collection--are calculated. These are then substituted for the relations that determine the use parameters, and finally the use parameters determine the number of people who will use the library and from what distance these people will come.

This procedure was actually applied to a test case of a new facility to be located in either the northeast corner of Baltimore City or the area adjacent in Baltimore County (see Figure 3). The probable library use of a total of ten different facilities, at five alternative sites, was simulated via the model that has been described.

Only actual statistics of use of one of these newly constructed facilities will tell how well the model has performed this simulation. Nevertheless, the results can be judged, on the reasonableness of their behavior, to be in accord with reality. The calculated use of each of the proposed facilities varied in two ways: (1) total number of users and (2) proportion of total users coming from near and from far. It is sufficient to observe on the basis of this limited information, that a careful examination of the predictions did not reveal any marked deviation from intuition or the judgment of library planners.

FIGURE 3
LIBRARY FACILITIES TESTED



■ EXISTING LIBRARY BRANCHES

▲ ALTERNATE SITES FOR NEW LIBRARIES

REGIONAL PLANNING COUNCIL

JUNE 1969

The objective of the short-range study was to develop a model that reflects the effects of (a) library characteristics and (b) socio-economic population characteristics upon the use of a given library, and to use this model to estimate the expected use of a new facility. Much was learned about the approach to take in analyzing the problem and data needs based on the limitations found to exist in available information. It must be acknowledged, however, that the results from the model were insufficient to have an impact upon the planning decision that had to be made in the test area. To this end, the results were dissappointing. It remains to be asked what policy insights can be gained from the model and what long-term improvements should be made on it.

Policy Insights

There are three ways a model of this type may provide policy insights valuable to decision-making:

1. The basic structural form of the model may lead to improved understanding of fundamental behavioral patterns.

2. The parameters appearing in the model may be interpreted as implying qualitative and quantitative cause-effect relationships.

3. The forecasts produced by the model in a variety of simulations may give a good picture of "real-world" response to policy changes.

Unfortunately the nature of the relationships implied by the model are too complex to allow much interpretation of the parameters (2) above; and too few simulations (10 in all) have been run to allow much to be learned from observing model performance (3) above. Thus, at the

present stage of model development and use, the policy insights attributable to it are limited. The following observations, however, should be made:

1. Use declines very markedly with increased distance between potential users and a library facility. Potential use is easily discouraged by the inconvenience of travel, indicating library services are not considered a vital necessity by the general public.

2. Increasing either the number of facilities or the size of existing facilities will increase the overall rate of use. Whether more use (for a given budget) would result from a pattern of a great number of small facilities or a lesser number of larger facilities can be answered only by more extensive analysis, including means of estimating total use within a library system and the cost of various system configurations.

3. In any general sub-region of the metropolitan area (e.g., the northeast corner of Baltimore City) a large scale facility's specific location will have relatively little impact on predicted use. Sites easily accessible to high-speed thoroughfares are somewhat more favored than sites less easily accessible, although physical, political and cost constraints probably remain the most important determinants of specific site selection.

Improving the Model

It appears that the basic direction provided by the model is fundamentally valid and useful. Research has been limited, however, by the scarcity of data and manpower. Both of these factors have dictated that a small number of variables have had to serve as proxy for a large number of effects. The model-building throughout has employed assumptions which (1) have enabled an interesting model to

be developed on limited resources, but which (2) have cast some doubt upon the accuracy, reliability, and stability of the model when applied to simulation and policy analysis.

A great deal has been learned during this short-range model-building effort. As a consequence, there are certain longer term improvements which now appear desirable to incorporate in the model. The model will be improved by:

1. Incorporation of such factors as (a) depth of service program, (b) provision of automobile parking, (c) staff competency, and other influences which directly affect library use.

2. Avoidance of a number of simplifying assumptions, e.g., population density and composition in the area around each library.

3. More detailed formulation of model structure and procedures for estimating results.

4. Development of procedures for determining systemwide use rather than that of a single facility.

Significant improvements in any of these four categories probably will require assembling new and more relevant data. If more data are required, the collection of the necessary information should be incorporated in a multi-purpose data instrument designed to shed light not only on library use but also on many of the questions and problems facing the library administrator. This face clearly indicates the need for long-range and continuing planning studies.

Conclusions Based on Short-Range Work Program

The consultants wish to emphasize these conclusions and limitations with respect to the research to date:

1. The behavioral model was developed in isolation, that is:

> No other libraries, public or private, including school, academic and special, were considered as to their effect on a proposed series of conclusions.

2. The overlap between branches in terms of use of each tested facility--gross-use versus net-use--is not taken into account. This fact is recognized and is justifiable reason for continued study in the proposed Long-Range Work Program.

3. The cost factors--larger units of service versus the traditional smaller and limited collections of most branch libraries--should also be considered in applying the behavioral model, to gain information concerning cost versus effectiveness.

4. Additional factors that should be brought to bear on the single facility model, include:

   a. variety of service patterns of libraries,
   b. variety of types of libraries that augment public library service patterns,
   c. availability of automobile parking for libraries,
   d. size and diversity of collections, and
   e. composition of potential user population, or definition of users.

5. The model produced resulted in conclusions for branch location fairly well matched by those reached by the independent study conducted by the director of the Baltimore County Library.

RECOMMENDATION

Inasmuch as the theory contained herein is a new approach to the solution of library problems, the consultants recommend, if any further expenditure of funds are to be made, that a member of the research team be employed for a period of several months to work with the library administrators in metropolitan Baltimore to provide specific guidance in building and utilizing models. If a management expert in simulation and model building were readily available to assist in the practical application of the theory described in this report, findings of the proposed program could be further validated and put to effective use.

There is a definite need for the further analysis and development of the statement of library objectives (see Foreword). An amplified statement might well involve a number of additional professional personnel, library and other, in order to gain greater understanding and acceptance of the role of the public library in today's political, cultural, intellectual and educational institutions that mandate a close look at library and information services. Thus Work Element B of the Long-Range Work Program Goals and Needs Analysis, should constitute a logical point of departure for implementing the planning process. Careful review of the functions, programs, services, organization, funding, relationships to community activities and all other aspects of the public library should be undertaken.

This further assessment of the goals of the public library could involve librarians of other Maryland or contiguous jurisdictions, librarians in other types of libraries, professsional planners and other appropriate professionals to undertake this comprehensive review with a view to establishing new directions in library and information services.

The results from undertaking Goals and Needs Analysis should provide the basis for subsequent action in the implementation of the work program.